

Warmup.

$$y = x^3 - 4x^2 + 2x - 1$$

1. Graph on your calculator. Sketch it.
 2. Is it an odd or even function?
 3. Describe the end behavior. $\{3.512\}$
 4. How many real zeros? Find them. -0.732
 5. How many relative maximums? Find them. -5.417
 6. How many relative minimums? Find them.
-
7. Sketch an even degree polynomial function with 1 relative max and 2 relative min.
 8. Sketch a poly. function with a degree of 5, a negative leading coefficient, and the max. # turning points.

7.3 Solving Equations Using Quadratic Techniques

ex 1:

$$x^4 - 29x^2 + 100 = 0$$

$$\text{Let } u = x^2$$

$$u^2 - 29u + 100 = 0$$

$$(u - 25)(u - 4) = 0$$

$$u = 25 \quad u = 4$$

$$\sqrt{x^2 = 25} \quad \sqrt{x^2 = 4}$$

$$x = \pm 5 \quad x = \pm 2$$

$$\{\pm 5, \pm 2\}$$

$$\frac{100}{-25} = -4$$

ex 2:

$$x^3 + 216 = 0$$

$$(x + 6)(x^2 - 6x + 36) = 0$$

$$x = -6$$

$$x = \frac{6 \pm \sqrt{36 - 4(1)(36)}}{2(1)}$$

$$\frac{6 \pm \sqrt{-108}}{2}$$

$$\frac{6 \pm 6i\sqrt{3}}{2}$$

$$\{-6, 3 \pm 3i\sqrt{3}\}$$

ex 3:

$$x^{\frac{1}{2}} - x^{\frac{1}{4}} - 6 = 0$$

$$\text{Let } u = x^{\frac{1}{4}}$$

$$u^2 - u - 6 = 0$$

$$(u - 3)(u + 2) = 0$$

$$u = 3 \quad u = -2$$

$$(x^{\frac{1}{4}})^4 = (3)^4 \quad (x^{\frac{1}{4}})^4 = (-2)^4$$

$$\{81\} \quad x = 81 \quad \cancel{x = 16} \quad \text{Must Check}$$

ex 4:

$$x^{\frac{2}{3}} - 2x^{\frac{1}{3}} - 24 = 0$$

$$\text{Let } u = x^{\frac{1}{3}}$$

$$u^2 - 2u - 24 = 0$$

$$(u - 6)(u + 4) = 0$$

$$u = 6 \quad u = -4$$

$$(x^{\frac{1}{3}})^3 = 6^3 \quad (x^{\frac{1}{3}})^3 = (-4)^3$$

$$x = 216 \quad x = -64 \quad \{-64, 216\}$$

ex 5:

$$x^5 - 81x = 0$$

$$x(x^4 - 81) = 0$$

$$x(x^2 + 9)(x^2 - 9) = 0$$

$$x = 0 \quad x^2 = -9 \quad x^2 = 9$$

$$x = \pm 3i \quad x = \pm 3$$

$$\{0, \pm 3i, \pm 3\}$$

Another way to solve a radical equation

ex 6:
 $x + \sqrt{x} = 12$

HW

p363

11-15 odd 18-20, 23,
27, 29 (grouping)